



2.2 ABLATION OF INAPPROPRIATE SINUS TACHYCARDIA GUIDED BY NONCONTACT MAPPING

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Introduction: ablation of inappropriate sinus tachycardia (IST) is generally associated with a high recurrence rate and relevant complications related to the multiple ablation lesions.

Methods: noncontact mapping was used to perform sinus node modification by RF energy in 4 women (35±4 years) affected by IST (mean heart rate in drug free-state of 108±7 b/min).

Results: a progressive caudo-cranial shift in the earliest activation was found in all patients during isoproterenol (iso) infusion (higher dosage-more cranial shift). The area of earliest activation with a unipolar electrogram showing a QS morphology was targeted for ablation, starting from the site corresponding to the highest dosage of iso. Successful ablation, marked by abrupt reduction in sinus rate, was obtained in all patients (8±4 RF applications). This reduction persisted also after iso infusion. No procedural complications were observed. After a follow-up of 4±3 months the mean heart rate was 75±4/min.

Conclusion: noncontact mapping allows to determine immediately the caudo-cranial shift during iso infusion and to verify quickly the origin of sinus beat after each RF pulses, reducing the total number of RF applications.

2.3 POSTSURGICAL ATRIAL TACHYCARDIAS: REPORT OF FOUR CASES NOT DUE TO MACRO-REENTRY

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Aim: to describe 4 cases of focal atrial tachycardias (ATs) and prior surgical atriotomy who underwent electrophysiological study (EPS) and successful radiofrequency ablation (RFA).

Methods: from a series of 52 pts undergoing EPS for postsurgical ATs, we identified 4 cases (7.6%; 2 M/2 F; 20, 30, 54, 32 yrs, respectively) in whom ATs were not due to macro-reentry. Standard multicatheter mapping was associated with electroanatomical mapping (CARTO, Biosense Webster) in 1 pt and with non-contact mapping (Ensite 3000, Endocardial Solution) in the other 3 pts. Five criteria were used to define the focal origin of the arrhythmias: 1 - no bipolar electrograms spanning the whole diastole during AT; 2 - activation duration in the atrium where AT originates <50% of AT cycle length; 3 - an abrupt negative deflection from the isoelectric line in the unipolar recordings at the earliest activation site; 4 - a spotty area of earliest activation at non-conventional mapping; 5 - a propagation pattern inconsistent with a macro reentrant circuit.

Results: programmed extrastimuli could easily induce and interrupt ATs in 2 cases, while in the remaining 2 cases ATs were induced by very aggressive atrial stimulation during isoprenaline infusion. Intravenous adenosine repeatedly resulted in AT interruption in 1 pt. The above-mentioned criteria were met in all the pts. AT foci were identified near the sinus node, close to the scar, in 2 pts, in the anterolateral part of the tricuspid annulus in 1 pt, while in the last case AT resulted from a bifocal activity, arising from the right inferior pulmonary vein ostium and the left atrium roof, respectively. In all the pts ATs were interrupted and made no more inducible by a single RF application. No recurrences were observed at a mean follow-up of 29±17 months.

Conclusions: in a small, but not negligible, part of pts with prior atrium surgery clinical AT is focal, not sustained from a macroreentrant scar-related circuit. Focal ATs can be successfully ablated by a single RF application at the earl stems support conventional mapping system both to define the AT mechanism and to localize the target site for ablation.

2.4 CATHETER ABLATION OF COMPLEX ATRIAL ARRHYTHMIAS WITH A NOVEL 3D MAPPING SYSTEM: THE REAL POSITION MANAGEMENT

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Aims: the aim of the study was to evaluate the usefulness of a novel contact mapping system the "Realtime Position Management (RPM)" dealing with complex substrate arrhythmia as atrial tachycardia (AT) and atrial ectopic beats (AEB). The RPM: is a contact mapping system, based on ultrasound ranging technique, and integrated with a traditional recording system. The system creates a 3D isochronal and isopotential map, where it is possible locate even a single pre-recorded AEB and analyze corresponding tracking catheter position.

Patients and methods: at our institution we treated with the RPM system 19 patients with symptomatic ectopic AT (47% males, mean age 57±15). Half of cases presented a non sustained form (10 patients).

Results and follow up: the procedures with RPM were successful in 16 cases (88.8%). At 5.3 month of follow up only 1 patient, had a recurrence. Comparing with our previous cases performed in traditional fashion, RPM procedures showed a significant higher success rate (88.8% vs. 83.4%) and lower fluoroscopy time (35min vs 45min).

Conclusions: the RPM system is a contact 3D mapping system particularly suitable for sustained and non sustained complex arrhythmias ablation. It allows reconstruction of a 3D anatomic isochronal and isopotential map, that can be updated on short arrhythmia episodes or even on single AEB.

2.5 EFFICACY AND SAFETY OF PERCUTANEOUS CRYOABLATION OF SEPTAL ARRHYTHMOGENIC SUBSTRATES TO TREAT SUPRAVENTRICULAR ARRHYTHMIAS

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Aim: to evaluate the efficacy and safety of transvenous cryoablation (CRYO) to treat septal arrhythmogenic substrates, close to the normal atrioventricular (AV) conduction pathways.

Methods: 19 pts (10 M; age 38±21, range 9-83 yrs) were considered: 11 had an accessory pathway (AP) (anteroseptal in 7, midseptal in 2 and posteroseptal in 2) and 8 had an AV nodal reentrant tachycardia (AVNRT). Three paediatric cases (<14 yrs) were included. Eight pts had already undergone an unsuccessful RF ablation or had recurrence thereafter. Based on the results of the previous procedures, in AVNRT pts, ablation of the slow (6 pts) or fast (2 pts) pathway was planned. A 7 F catheter (Freezor, Cryocath Technologies Inc) was used, in which the cooling effect in the distal electrode was obtained by N₂O expansion. Cryoablation (at -75°C up to 480 s) was preceded by test applications delivered at a step-by-step decreasing temperature from 0 to -75°C. If inadvertent modification of conduction over the normal AV pathway was observed, the application was immediately discontinued.

Results: 18/19 pts were successfully treated by CRYO, obtaining interruption of AP conduction (10 pts) and selective ablation of slow (6 pts) or fast (2 pts) AV node pathway. In a paediatric pt, disappearance of conduction over a parahissian AP was not observed during test applications and the ablation procedure was postponed. No pt had complications, nor felt discomfort during CRYO. Cryoadherence effect was well evident below -20°C. In 3 pts, transient inadvertent modification of conduction over the normal AV pathway were observed, but they rapidly reverted upon application discontinuation. In the 11±3 month follow-up, 1 pt had recurrence and was successfully retreated.

Conclusions: CRYO is effective and safe to treat arrhythmogenic substrates close to the normal AV conduction pathways, even in paediatric cases. Inadvertent modifications of the normal AV conduction are reversible if the application is timely discontinued. Cryoadherence effect is both safe and useful in this critical area. CRYO is absolutely painless.

2.6 ELECTROPHYSIOLOGICAL EVALUATION OF SYMPTOMATIC VENTRICULAR PRE-EXCITATION IN CHILDREN AND ADOLESCENTS

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Aim: to evaluate the role of electrophysiological study (EPS) in the assessment of the arrhythmic risk in asymptomatic pts with VPE.

Methods: 62 asymptomatic children (38M/24F, aged 9.8±5.1 years) referred to our Division (1996-2002) for an incidentally found VPE, underwent an EPS.

Results: during EPS 36pts (58.1%) experienced sustained SVT. The tachycardia was initiated in the basal state in 22pts and after isoproterenol in 14pts. Orthodromic AVRT (cycle length 305.9±48.5ms) was recorded in 29pts. In 3pts were recorded both orthodromic and antidromic AVRT, with different cycle length (CL). Antidromic AVRT alone (CL 239.5±13.7ms) was recorded in 4pts. AF was recorded in 9pts: in 6pts after the induction of AVRT, in the other 3 cases AF was the first and only arrhythmic event. The minimal RR between two consecutive pre-excited QRS ranged between 250-230ms (mean 237.5±9.6ms). In the 26 pts who presented no induced sustained tachycardia in the EPS, the 1:1 conduction over the AP ranged between 210-600ms (mean 279.6±75.2ms).